



Five selected as Los Alamos National Laboratory Fellows

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Scientific disciplines range from fundamental and applied physics to geology

LOS ALAMOS, New Mexico, NOVEMBER 16, 2010—Five Los Alamos National Laboratory scientists from diverse fields of research have been named Laboratory Fellows. The five researchers are Brenda Dingus of the Neutron Science and Technology group; William (Bill) Louis of the Subatomic Physics group; John Sarrao, director of Los Alamos's Office of Science Programs; Dipen Sinha of the Sensors and Electrochemical Devices group; and Giday Woldegabriel of the Computational Earth Sciences group.

"These five outstanding scientists reflect the breadth of research at Los Alamos," said Terry Wallace, principal associate director for science, technology, and engineering. "Their vast and varied achievements illustrate why LANL is the nation's premier national security science laboratory. We are extremely pleased to welcome these researchers to the Laboratory Fellows organization."

The Fellows organization was established in 1981 and is composed of technical staff members who have been appointed by the Laboratory director to the rank of Fellow in recognition of sustained outstanding contributions and exceptional promise for continued professional achievement. Fellows are limited to 2 percent of the Laboratory's technical staff. They advise management on important issues, promote scientific achievement, and organize symposia and public lectures. The organization administers the annual Fellows Prize for Outstanding Research in Science or Engineering and the Fellows Prize for Outstanding Leadership in Science or Engineering.

The 2010 Fellows were selected from a field of 18 nominees. A committee of scientists and engineers from across the Laboratory reviewed the nominations and recommended finalists that were confirmed by the Laboratory Director.

Brenda Dingus has pioneered work in gamma-ray bursts and is a major contributor to the relatively young scientific field of very-high-energy gamma-ray astronomy. As someone at the forefront of her field, she is described as being peerless. Dingus's seminal contributions span two decades, from her discovery of the high-energy component of gamma-ray burst emissions to her current work developing the next generation of all-sky, ground-based gamma-ray detectors. In 2006 she was elected a Fellow of the American Physical Society, and in 2000 she received the

Presidential Early Career Award for Scientists and Engineers. Dingus has more than 100 publications to her credit with more than 7,600 citations.

William (Bill) Louis is one of the world leaders in neutrino physics and has led the Los Alamos accelerator-based neutrino experiments since the early 1990s. In particular, Louis led the Large Scintillation Neutrino Detector (LSND) collaboration, the most successful neutrino experiment to be carried out at the Los Alamos Neutron Science Center, and he is coleader of the MiniBooNE experiment initiated in 1999 at Fermi National Accelerator Laboratory. The results from LSND were both striking and anomalous; if confirmed definitively, they would require a major revision to the Standard Model of the universe, or at a minimum a revision to include the existence of “light, sterile neutrinos.” Recent results from MiniBooNE did not observe all the expected results from LSND. However, they do show an unexpected low-energy behavior of the spectrum of neutrino events that also would require rethinking aspects of neutrinos and the Standard Model. Should these combined results turn out to be correct, many in the field will consider the discoveries to be historic. Louis’s publication record of more than 70 papers includes 22 with more than 50 citations, and three of them having more than 500 citations. He is a Fellow of the American Physical Society.

John Sarrao discovered the first plutonium-based superconductor, revolutionizing the field of actinide materials research. The discovery, coupled with Sarrao’s series of important discoveries of new materials and new physics, has made an enduring worldwide impact in condensed-matter physics. He is recognized for momentous contributions to the field of strongly correlated electron systems. His work has generated great excitement in the materials physics community, and research efforts around the world have been redirected to build upon Sarrao’s discoveries. His work has been cited more than 6,000 times, and he was distinguished as LANL’s most published author every year between 2001 and 2007. Sarrao is a Fellow of the American Physical Society and the American Association for the Advancement of Science. He received the LANL Fellows Prize for Outstanding Research in 2004. Sarrao now brings his exceptional creativity and scientific insight to bear as the lead for the Laboratory’s materials-centric future signature facility, MaRIE (Materials-Radiation Interactions in Extremes), which is intended to revolutionize the understanding of materials in extreme environments and conditions.

Dipen Sinha is known for his expertise in a wide range of disciplines, including low-temperature physics, ultra high-speed measurements, infrared detector arrays, organic thin films, biomedical instrumentation, acoustics, and geophysics. One of his major accomplishments is the development, refinement, and exploitation of Swept Frequency Acoustic Interferometry (SFAI), a technique for noninvasive characterization of fluids. Applying theory and novel instrumentation, Sinha extended this technique to allow noninvasive interrogation of fluids in sealed containers. His work has enabled wide application of SFAI to national security missions, including chemical and biological warfare treaty verification, and rapid identification of chemical and biological warfare agents inside sealed munitions. In 2005, *Scientific American* identified his bioweapons detection work as one of the top five inventions in acoustics. Applying additional creative and innovative ideas to nonlinear acoustics, his work is being applied to remote landmine and concealed weapons detection.

In the fields of medicine and biology Sinha’s work has led to development of the Acoustic Flow Cytometer, which recently was licensed by a pharmaceutical company for detection of and discrimination between benign and cancerous breast tumors. He

has won three R&D 100 awards, the LANL Distinguished Licensing Award, and twice received LANL's Distinguished Patent Award.

Giday Woldegabriel is coleader of an international research team responsible for discovering the oldest nearly intact skeleton of *Ardipithecus Ramidus*, who lived 4.4 million years ago. "Ardi" is the earliest skeleton known from the human branch of the primate family tree; its discovery provides new insights into how hominids may have emerged from an ancestral ape. The discovery and associated research were named *Science* magazine's Breakthrough of the Year for 2009 and *Time* magazine's number-one science story of 2009. Woldegabriel's key scientific contribution to this discovery is the geologic interpretation and geochronologic dating of the strata in which the fossils were found. Additionally, he was instrumental in facilitating the entire field investigation that enabled the discoveries and interpretation of the flora and fauna of the time period in which the early hominid existed. Woldegabriel's most recent work includes invaluable geology-related contributions to multiple programs. His work has helped track migration of radionuclides in groundwater, geothermal energy exploration, and carbon management of fossil fuel combustion byproducts. His work has led to substantially increased understanding of the complex volcanic structure and evolution of the Pajarito Plateau and the Nevada Test Site. Woldegabriel received the Fellows Prize for Research in 2001, and has nearly 45 publications and about 1,500 citations to his credit.

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